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The projections of instructional staff for resident degree-credit courses for the United States and outlying parts presented in this publication are based on the assumptions that enrollment will increase to 7 million by 1970 and that the student-staff ratio will increase about 17 percent between 1960 and 1970.

The assumptions adopted were based on an analysis of Office of Education instructional staff statistics for 1951–60 and National Science Foundation data on college science teachers in 1961.

Projected growth of faculty for resident degree-credit courses are presented for all fields combined and separately for the field of science, with breakdowns for (1) the life sciences, and (2) engineering, mathematics, and physical sciences.

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Instructional Staff in Institutions of Higher Education, Projected to 1970-71

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U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Anthony J. Celebrezze, Secretary

Office of Education – Francis Keppel, Commissioner

Foreword

The projections of instructional staff for resident degree-credit courses in this publication should be useful to school administrators, research workers, and others who are interested in the problem of staffing the Nation's colleges and universities. These projections are based on the assumptions that college and university enrollment will increase to 7 million by 1970 and that the student-staff ratio will increase about 17 percent between 1960 and 1970.

The assumptions were based on an analysis of Office of Education instructional staff statistics for 1951-60 and National Science Foundation data on college science teachers in 1961.

Ralph C. M. Flynt
Associate Commissioner for
Educational Research and Development

Virgil R. Walker
Acting Director
Division of Educational Statistics

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Scope and Method

The purpose of this report is to supply projections of the number of instructional staff for resident degree-credit instruction in all courses and in science courses.[1] The projections are based on 1950-60 Office of Education data on all degree-credit instruction and 1961 National Science Foundation data for science teaching. These projections cover the period 1960-61 to 1970-71 for the United States and outlying parts. The most important assumptions used in the projections shown in this report are that college enrollment will follow the 1950-60 trend,[2] and that the student-staff ratio will increase from 12 to 1 in 1959-60 to 14 to 1 in 1969-70. If college enrollment does not follow the trend and if the student-staff ratio does not increase to 14 to 1 by 1970, the number of college instructional staff will be different from the projected figures shown in this report.

In 1959-60 the number of different persons teaching resident degree-credit courses was 283,080, or 74 percent of the total number of faculty and professional persons employed in colleges and universities. (See table 1.) The projected number of persons teaching all resident degree-credit courses is shown in table 2. This projection is based on the assumptions that the total degree-credit enrollment will increase to 7 million by fall 1970, that the student-staff ratio will increase from 12 to 1 in 1959-60 to 14 to 1 by 1969-70, and that the percent of total instructional staff employed as part-time instructor or above, and as junior instructional staff, will remain constant at the 1959-60 level of 28.5 percent and 13.6 percent, respectively.

The projected number of full-time equivalent instructional staff for resident degree-credit courses is shown in table 3. This projection assumes that the full-time equivalent of part-time instructor and above will remain at the 1957-59 level (31.8 percent) until 1970. This same percentage is used to estimate the full-time equivalent of total junior instructional staff.

The estimated number of full-time equivalent teachers of resident degree-credit courses in the life sciences, and engineering, mathematics, and physical science as of 1961 is shown in table 4. Projections of full-time equivalent teachers in these two groups are shown in table 5. These projections are based on the assumptions that the number of bachelor's and first-professional (first-level) degrees granted in the life sciences will increase from 51,000 in 1960-61 to 93,000 in 1974-75, and that the number of such degrees granted in engineering, mathematics, and the physical sciences will increase from 65,000 in 1960-61 to 154,000 in 1974-75. It is assumed that the number of science instructional staff for any particular year is determined to a large extent by the number of first-level science degrees granted in that year, plus those for the three succeeding years. For example, science instructional staff for 1960-61, as a percent of total science degrees for 1960-61 through 1963-64, was estimated at 10.2 percent for the life sciences and 13.0 percent for engineering, mathematics, and physical sciences. It was assumed that these percentages would decrease to 9.9 percent and 12.5 percent, respectively, by 1970-71.

1/ Projections are for total instructional staff employed, and do not show breakdowns for replacements and additions.

2/ See table 7 for trend enrollment projections.

Projected Growth of Faculty for All Resident Degree-Credit Courses

In the 1957-61 period, the *full-time equivalent* instructional staff for teaching all resident degree-credit courses increased about 10,000 per year. Future growth is expected to be higher. Average annual growth during the 1962-71 decade will be over 14,000.

The *total* number of persons teaching resident degree-credit courses during the 1957-61 period increased almost 14,000 per year. The total instructional staff will probably increase about 21,000 per year during the 1962-71 decade. The increase for teaching staff with the rank of instructor or above will be almost 12,000 per year for full-time, and 6,000 per year for part-time staff. The junior instructional staff, almost all of whom are estimated to be part-time teachers, will increase almost 3,000 per year.

Projected Growth of Faculty for Resident Degree-Credit Science Courses

The enrollment increases required to fill national needs for persons educated in the sciences during the next decade are likely to result in the requirement of larger percentage increases in instructional staff for science courses than for other courses.

The instructional staff for the life sciences is expected to be 41 percent higher in 1965-66 and 59 percent higher in 1970-71 than it was in 1960-61; the staff for engineering, mathematics, and the physical sciences is likely to be 44 percent higher in 1965-66 and 89 percent higher in 1970-71 than it was in 1960-61. The staff for fields other than science is expected to increase at a slower rate: 31 percent higher in 1965-66 and 65 percent higher in 1970-71 than in 1960-61.

The full-time equivalent instructional staff for resident degree-credit courses in the life sciences is expected to increase at an average rate of 1,300 per year in the 1962-71 decade, with the largest increases occurring in the first half of the decade. Increases in the number of teachers for engineering, mathematics, and the physical sciences will probably average 3,200 per year over the 1962-71 decade.

Table 1.—Faculty and other professional staff, number of positions and number of persons: United States and outlying parts, first term 1959-60 1/

Type of position	Number of positions	Number of different persons
All positions 2/	3/ 431,720	3/ 382,664
Faculty for resident instruction in degree-credit courses only 4/	283,080	283,080

1/ Source: *Summary Report, Faculty and Other Professional Staff in Institutions of Higher Education, 1959-60* (OE-53014) by Felix H. I. Lindsay, issued December 1961 by U.S. Department of Health, Education, and Welfare, Office of Education, Washington 25, D. C.

2/ Includes faculty and other professional staff for resident instruction in degree-credit courses, resident instruction in other than degree-credit courses, extension education, courses by mail, radio or T. V., library, elementary or secondary instruction, student personnel services, administration, and organized research.

3/ The sum of the number of persons in all types of positions exceeds the number of different persons, because some professional staff serve in more than one capacity.

4/ Includes full-time and part-time staff with rank of instructor or above and junior instructional staff, such as assistant instructors, teaching fellows, teaching assistants, and laboratory assistants.

Table 2.—Total instructional staff for resident degree-credit courses: United States and outlying parts, 1949-50 to 1970-71 [1/]

Academic year	Total	Instructor or above			Junior instructional staff
		Total	Full-time	Part-time	
1949-50 (academic year)	191,396	2/	2/	2/	2/
1951-52 " "	184,826	2/	2/	2/	2/
1953-54 (fall)	208,547	182,028	2/	2/	26,519
1955-56 "	227,929	197,791	2/	2/	30,138
1957-58 (first term)	260,486	226,536	154,602	71,934	33,950
1959-60 " "	283,080	244,461	163,656	80,805	38,619
	ESTIMATED				
1960-61 " "	296,000	256,000	172,000	84,000	40,000
1961-62 " "	312,000	269,000	183,000	86,000	43,000
	PROJECTED [3/]				
1962-63 " "	334,000	289,000	194,000	95,000	45,000
1963-64 " "	345,000	298,000	200,000	98,000	47,000
1964-65 " "	370,000	320,000	215,000	105,000	50,000
1965-66 " "	398,000	344,000	231,000	113,000	54,000
1969-70 " "	480,000	415,000	278,000	137,000	65,000
1970-71 " "	501,000	433,000	290,000	143,000	68,000

1/ Source of actual data: *Biennial Survey of Education in the United States,* Chapter 4, Section I, *Statistics of Higher Education: Faculty, Students, and Degrees, 1949-50, 1951-52,* and *1953-54* by Henry G. Badger; *Faculty in Institutions of Higher Education, November, 1955* (Circular 504), by M. Clemens Johnson and Leah W. Ramsey; *Faculty and Other Professional Staff in Institutions of Higher Education, First Term 1957-58* (Circular 596), by Wayne E. Tolliver and Hazel C. Poole. U.S. Department of Health, Education, and Welfare, Office of Education. Washington: U.S. Government Printing Office, 1952, 1955, 1956, 1957, and 1959. Data for 1959-60 from *Summary Report, Faculty and Other Professional Staff in Institutions of Higher Education, 1959-60* (OE-53014) by Felix H. I. Lindsay, issued December 1961 by the Office of Education. Estimates for 1960-61 and 1961-62 are based on unpublished Office of Education data, for fall 1961, on instructional staff in universities.

2/ Data not available.

3/ The projection of total instructional staff is based on the assumptions that total degree-credit enrollment will increase to 7 million by Fall 1970 and that the student-staff ratio will increase from 12 to 1 in 1959-60 to 14 to 1 by 1969-70. It is assumed that the percent of total instructional staff employed as part-time instructors or above and as junior staff will remain constant at the 1959-60 level of 28.5 percent for part-time instructors or above and 13.6 percent for junior staff.

Table 3.–Full-time equivalent instructional staff for resident degree-credit courses: United States and outlying parts, 1953-54 to 1970-71 [1]

Academic year	Total full-time equivalent	Instructor or above			Full-time equivalent of junior instructional staff
		Total full-time equivalent	Full-time	Full-time equivalent of part-time	
1953-54 (fall). . . .	148,304	140,304	[2]	[2]	[3] 8,000
1955-56 "	161,322	151,322	[2]	[2]	[3] 10,000
1957-58 (first term)	188,554	177,554	154,602	22,952	[3] 11,000
1959-60 " "	201,283	189,283	163,656	25,627	[3] 12,000
	ESTIMATED				
1960-61 " "	212,000	199,000	172,000	27,000	13,000
1961-62 " "	226,000	212,000	183,000	29,000	14,000
	PROJECTED [4]				
1962-63 " "	238,000	224,000	194,000	30,000	14,000
1963-64 " "	246,000	231,000	200,000	31,000	15,000
1964-65 " "	264,000	248,000	215,000	33,000	16,000
1965-66 " "	284,000	267,000	231,000	36,000	17,000
1969-70 " "	343,000	322,000	278,000	44,000	21,000
1970-71 " "	357,000	335,000	290,000	45,000	22,000

[1] Source of actual data: Badger, Johnson and Ramsey, Tolliver and Poole, and Lindsay, *op. cit.*, table 2, footnote 1.

[2] Data not available.

[3] Full-time equivalent junior staff as a percent of total junior staff is estimated to be the same (31.8 percent) as for part-time instructors and above.

[4] The projection of full-time equivalent of part-time instructors and above is based on the assumption that full-time equivalent as a percent of part-time staff will remain at the 1957-59 level of 31.8 percent; and that this same percent will apply to the number of junior instructional staff. This percent (31.8) was multiplied by the number of part-time and junior instructional staff shown in table 2.

Table 4.–Full-time equivalents of scientists and engineers employed in colleges and universities, by type of employment: United States and outlying parts, March 1, 1961

Field of science	Full-time equivalents employed		
	Total for teaching, research and development, and other activities in all colleges and universities[1/]	Number for research and development and other activities in institutions granting graduate degrees in science and engineering[1/]	Number for teaching (resident degree-credit instruction) in all colleges and universities[2/]
Total	111,900	53,400	58,500
Engineering, mathematics, and physical sciences[3/]	60,800	24,700	36,100
Life sciences[4/]	51,100	28,700	22,400

1/ National Science Foundation, *Reviews of Data on Research and Development, Science and Engineering Professional Manpower Resources in Colleges and Universities, 1961 (preliminary report)*, Number 37 NSF 63-4, January 1963, p. 1-12.

2/ Derived by subtracting the number employed for research and development and other activities in institutions granting graduate degrees from the total number of scientists and engineers employed in all colleges and universities. Almost all (99 percent) of the scientists and engineers employed for research and development and other activities in colleges and universities are in institutions granting graduate degrees.

3/ Physical sciences include physics, chemistry, and earth sciences.

4/ Life sciences include anatomy, biochemistry, microbiology, pathology, pharmacology, physiology, biology, botany, entomology, zoology, clinical science, and commodity-related agricultural.

Table 5.—Full-time equivalent instructional staff for resident degree-credit courses, in science and in all other fields combined: United States and outlying parts, 1955-56 to 1970-71

Academic year	Full-time equivalents				
			Sciences[1]		
	All fields[2]	All fields other than science	Total sciences	Life sciences[3]	Engineering, mathematics, and physical sciences
1955-56 (fall)	161,000	[4]	[4]	[4]	[4]
1959-60 (first term)	201,000	[4]	[4]	[4]	[4]
	ESTIMATED				
1960-61 " "	212,000	154,000	58,000	22,000	36,000
	PROJECTED				
1961-62 " "	226,000	164,000	62,000	24,000	38,000
1962-63 " "	238,000	173,000	65,000	25,000	40,000
1963-64 " "	246,000	176,000	70,000	27,000	43,000
1964-65 " "	264,000	188,000	76,000	29,000	47,000
1965-66 " "	284,000	201,000	83,000	31,000	52,000
1969-70 " "	343,000	243,000	100,000	34,000	66,000
1970-71 " "	357,000	254,000	103,000	35,000	68,000

1/ The sources of basic data and the methodology for estimating 1960-61 instructional staff for the sciences are shown in table 4. Projections of science instructional staffs are based on the assumption that the number of bachelor's and first-professional (first-level) degrees granted in the life sciences will increase from 51,000 in 1960-61 to 93,000 in 1974-75 and that the number of such degrees granted in engineering, mathematics, and the physical sciences will increase from 65,000 in 1960-61 to 154,000 in 1974-75. It is assumed that the number of science instructional staff for any particular year is determined to a large extent by the number of first-level science degrees granted in that year, plus those for the three succeeding years. For example, science instructional staff for 1960-61, as a percent of total science degrees for 1960-61 through 1963-64, was estimated at 10.2 percent for the life sciences and 13.0 percent for engineering, mathematics, and physical sciences. It was assumed that these percentages would decrease to 9.9 percent and 12.5 percent, respectively, by 1970-71.

2/ The source of basic data and the methodology for projecting instructional staff for all fields are shown in table 3.

3/ Includes anatomy, biochemistry, microbiology, pathology, pharmacology, physiology, biology, botany, entomology, zoology, clinical science, and commodity-related agricultural.

4/ Data not available.

Table 6.—Index of full-time equivalent instructional staff for resident degree-credit courses, in science and in all other fields combined, with 1960-61 at 100: United States and outlying parts, 1955-56 to 1970-71

Academic year	All fields	All fields other than science	Sciences		
			Total sciences	Life sciences	Engineering, mathematics, and physical sciences
1955-56 (fall)	76	2/	2/	2/	2/
	ESTIMATED				
1960-61 (first term)	100	100	100	100	100
	PROJECTED				
1965-66 " "	134	131	143	141	144
1970-71 " "	168	165	178	159	189

1/ Derived from data in table 5.

2/ Data not available.

Table 7.—Total fall enrollment in institutions of higher education: United States and outlying parts, 1950 to 1975

Year (fall)	Opening enrollment	Year (fall)	Opening enrollment
	Actual[1]		Projected[2]
1950	2,296,592		
1951	2,116,440		
1952	2,148,284		
1953	2,250,701	1965	5,257,000
1954	2,468,596		
1955	2,678,623		
1956	2,946,985		
1957	3,068,417		
1958	3,258,556		
1959	3,402,297		
1960	3,610,007	1970	7,007,000
1961	3,891,230		
1962	4,206,672		
		1975	8,677,000

1/ Source of actual data: *Opening (Fall) Enrollment in Higher Education, 1960: Analytic Report* (Circular 652, OE-54007-60) by Edith M. Huddleston; and *Opening (Fall) Enrollment in Higher Education, 1962: Institutional Data* (Circular 697, OE-54003-62) by Division of Educational Statistics, Bureau of Educational Research and Development. U.S. Department of Health, Education, and Welfare, Office of Education. Washington: U.S. Government Printing Office, 1961 and 1962.

2/ See *College and University Enrollment: Projections* by Louis H. Conger, Jr., in *Economics of Higher Education,* Chapter I, (OE-50027, Bulletin 1962, No. 5), by Selma J. Mushkin. U.S. Department of Health, Education, and Welfare, Office of Education. Washington: U.S. Government Printing Office, 1962. This projection is based on the assumption that enrollment rates in specific age groups will follow the 1950-60 trend.

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